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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/531,451

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EXAMINER

WEINSTEIN, LEONARD J

ART UNIT

PAPER NUMBER

3746

MAIL DATE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/531,451	<b>Applicant(s)</b> KAKIUCHI, TAKASHI	
	<b>Examiner</b> LEONARD J. WEINSTEIN	<b>Art Unit</b> 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 September 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. This office action is in response to the amendment of September 9, 2008. In making the below rejections and/or objections the examiner has considered and addressed each of the applicant's arguments.
2. The examiner acknowledges the amendments to claim 2. The examiner notes that claim 1 has been canceled.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:
  1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. Claims 2, 4, 6, 10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kessler 4,406,590 in view of Turley Us 2,838,941. Kessler teaches all the limitations as claimed for a hermetic compressor including: **[claim 2]** an electric motor element 46, a compression element 77 driven by the electric motor element 46, a closed container 27 accommodating the electric motor element 46 and compression

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element 77, and a refrigerant contained in the closed container 27, the compression element 77 comprising, a shaft (fig. 2) having an eccentric shaft body 190 and a main shaft body 60, a cylinder block 77 having a compression chamber 76, a piston 84 moving reciprocally in the compression chamber 76, connecting means 198 for connecting the piston 84 and the eccentric shaft body 190, and a balance weight 234 formed on the shaft (fig. 2), wherein the piston 84 is positioned on a horizontal extension 192 of the balance weight 234, and wherein the balance weight 234 is formed in such a shape that the distance between the outer circumference of the balance weight 234 and the piston 84 is substantially constant during a period in the rotation of the balance weight 234 in which an outer circumference of the balance weight 234 and piston 84 are at their closest proximity, and a subsidiary shaft body 184 formed coaxially with the main shaft body 60, and a subsidiary bearing, element 188 of element 64, for supporting the subsidiary shaft body 184, wherein the balance weight 234 is provided at the end of the eccentric shaft body 190 side of the subsidiary shaft body 184.

Further with respect to claim 2 Kessler teaches a hermetic compressor wherein the axial center of the main shaft body is taken to be the origin; x-coordinate and y-coordinate of outer circumference of the balance weight can substantially be expressed as follows:

$$x = [s \cdot \cos(360^\circ - \theta) + L \cdot \cos\{(\sin^{-1}(s \cdot \sin(360^\circ - \theta) / L)\} + C - \alpha] \cdot \cos(360^\circ - \theta)$$

$$y = [s \cdot \cos(360^\circ - \theta) + L \cdot \cos\{(\sin^{-1}(s \cdot \sin(360^\circ - \theta) / L)\} + C - \alpha] \cdot \sin(360^\circ - \theta)$$

- **Where  $s$  is the distance between axial center of main shaft body and axial center of eccentric shaft body,**
- **$L$ , pitch length of connecting means,**
- **$C$ , skirt length of piston,**
- **$\alpha$ , distance between outer circumference of balance weight and piston**
- **$\theta$ , rotation angle of eccentric shaft body**

Kessler teaches all the limitations including a hermetic compressor having elements arranged in a configuration as discussed in claim 1. Since Kessler teaches the same configuration and the elements as discussed have the same spatial relationship as the instant application, a value for each the variables listed in the x and y coordinate expressions can be determined. Therefore the x and y coordinates of the outer circumference of the balance weight of Kessler (234) can be expressed by the equations as discussed.

Further with respect to claims 4 and 10, the recitation of a balance weight formed by either sinter alloy or press processing of iron plate is considered to be a product-by-process and is not patentable over the balance weight (234) of Kessler. The determination of patentability in a product-by-process claim is based on the product itself, even though the claim may be limited and defined by the process. That is, the product in such a claim is unpatentable if it is the same as or obvious from the product of the prior art, even if the prior product was made by a different process. In re Thorpe, 777 F.2d 695, 697, 227 USPQ 964, 966 (Fed. Cir. 1985). A product-by-process

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limitation adds no patentable distinction to the claim, and is unpatentable if the claimed product is the same as a product of the prior art.

The compressor of Kessler teaches a balance weight and piston wherein the outer circumference of the balance weight and the bottom of a piston are separated by a constant distance for at least a portion of time when a piston transitions from a suction stroke to a compressor stroke (or when the weight and the piston are closest to one another). There is no explicit teaching provided by Kessler stating that this distance is held constant for the entire period of time in which the balance weight and the piston are closest to one another. Turlay teaches a compressor (of an internal combustion engine) with a piston 23 reciprocating in a cylinder 22 by a connection to a crankpin 27 of crankshaft 12 with a balance weight 53. Further Turlay teaches that “the counterweights... will clear by a constant amount the lower ends of the pistons 23 when the pistons move below the lower extremities of the cylinder 22.” Turlay shows that it was known at the time of the invention that a configuration of a balance weight and piston as claimed provides “the greatest possible radius of gyration for the center of mass of counterweight” (Turlay – col. 2 ll. 18-26). This also allows for the center of mass of the counterweight to be distance further from the axis of rotation of a crankshaft. This would increase the moment ( $N \cdot m$ ) of a balance weight about the axis of rotation, and provide for more balanced rotation of the crankshaft especially during a compressor stroke, while also decreasing the amount of counter weighting required. Therefore it would have been obvious to one of ordinary skill in the art to provide a compressor as taught by Kessler with a balance weight on a crankshaft that remained

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at a constant distance from a piston for the entire time a piston and balance weight were closest to each in order to reduce the degree of counter weighting required for optimal operation (Turlay – col. 2 ll. 18-26).

6. Claims 3 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kessler US 4,406,590 in view of Turlay US 2,838,941. A combination of Kessler and Turlay teaches the general conditions of the claimed invention except for the express disclosure of a distance between an outer circumference of a balance weight and a piston is 2 mm or less. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the distance between outer circumference of a balance weight and a piston 2 mm or less, since the claimed values are merely an optimum or workable range. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

7. Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kessler US 4,406,590 in view of Turlay US 2,838,941, as applied to claim 1 above, further in view of Nozaki et al. US2004/0057859. A combination of Kessler and Turlay teaches all the limitations as discussed but fails to teach the limitation that is taught by Nozaki for a hermetic compressor (fig. 1) wherein the refrigerant is R600a (Nozaki - ¶ 0030). It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a natural refrigerant such as isobutene (R600a) as the refrigerant in a hermetic compressor in order to reduce the global warming impacts of the operation of the hermetic compressor (Nozaki - ¶ 0002). It is further noted by the

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examiner that a recitation with respect to the material intended to be worked upon by a claimed apparatus does not impose any structural limitations upon the claimed apparatus which differentiates it from the prior art apparatus satisfying the structural limitations of the claims, as is the case here.

8. Claims 7-8 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kessler US 4,406,590 in view of Turley US 2,838,941, as applied to claim 1 above, further in view of Hayashi et al. 5,506,486. A combination of Turley and Kessler teaches all the limitations as discussed but fails to teach the following limitations that are taught by Hayashi for a hermetic compressor including: an electric motor element 1 driven by an inverter 40 at plural operating frequencies, as shown in figure 13 wherein the solid line shows a relationship between a range of operating frequencies and corresponding operating efficiency of the compressor, including at least an operating frequency of less than the power source frequency (col. 3 ll. 31-35) and at least an operating frequency of less than 30 Hz (fig. 13). It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an inverter to drive a motor of a compressor and operate a compressor at a frequency less than a power frequency in order to reduce electric power consumption (Hayashi – col. 59-62).

### ***Response to Arguments***

9. Applicant's arguments filed September 9, 2008 have been fully considered but they are not persuasive. The examiner notes that the limitations of now canceled claim 1 have been incorporated into the limitations of claim 2. The applicant argues that Kessler fails to teach the same configuration and elements as discussed previously in



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claim 1. The applicant further argues that Kessler does not meet the criteria put forth by the equation of claim 2 (which now includes the former limitations of claim 1). The applicant further argues that Turlay does not in fact remedy the purported deficiency of Kessler.

a. In response to the applicant's argument that Kessler does not teach the elements on now canceled claim 1, the examiner disagrees. As has been discussed above, the elements of Kessler teaching the claimed limitations have been identified by numeral next to the components of the claim 2. Further the examiner maintains that Kessler teaches the exact configuration that is disclosed and therefore the available subject matter which can be claimed. Every single component of the equation that has been disclosed will have a value for almost any counterweight that is incorporated into a hermetic compressor with a reciprocating piston similar to that of the prior art and the instant application. Every counterweight will have a value for  $s$  (distance between axial center of main shaft and axial center of eccentric shaft),  $L$  (pitch length of a connecting means),  $C$  (skirt length of piston),  $\alpha$  (distance between an outer circumference of balance weight and piston), and  $\theta$  (rotation angle of an eccentric shaft body). The examiner has made no assumptions, merely drawn the obvious conclusion that almost all reciprocating piston compressors will have a value for each one of these variables and therefore all of them can be described using the equation disclosed.

b. The examiner disagrees with the applicant's assertion that Kessler in combination with Turlay does not meet the criteria of the claimed equation. The examiner further disagrees with the applicant's argument that Turlay does not teach counterweights that clear a piston by a constant distance through an arc-length of the counterweight's rotation in which any portion of the weight is spatially adjacent to (or in front of) the piston. The examiner also notes that the applicant has mischaracterized the examiner's grounds for rejection since the examiner did rely on Turlay to remedy what the examiner believed Kessler to be silent on and gave motivation based on the disclosure of Turlay of why Kessler would meet the limitations as claimed or be modified to meet the limitations as claimed.

The examiner notes that the dimensions of the counterweight of the instant invention are such that for any expression of  $x$  and  $y$  for the equation that is disclosed and claimed, the variable  $\alpha$  will be constant. Again  $\alpha$  is defined as the distance between an outer circumference of balance weight and piston. Turlay teaches a compressor with a reciprocating piston driven by a shaft with an eccentric portion and a counterweight that "will clear by a constant amount the lower ends of the pistons 23 when the pistons move below the lower extremities of the cylinders 22." (Turlay – col. 2 ll. 24-26) Turlay teaches that this design provides "the greatest possible radius of gyration for the center of mass of counterweights." Thus examiner maintains that Turlay provides a teaching and a motivation for providing a counterweight meets the limitations as claimed. Further if it is not implicitly taught by the resemblance of common components

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between Kessler and instant invention, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the counterweight taught by Kessler so that there would be a constant distance between a piston and outer circumference of a counterweight, as explicitly taught by Turlay, to provide the maximum radius of gyration for the center of mass of the counterweight.

### ***Conclusion***

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEONARD J. WEINSTEIN whose telephone number is (571)272-9961. The examiner can normally be reached on Monday - Thursday 7:00 - 5:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571) 272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/  
Supervisory Patent Examiner, Art  
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